

ANDREA PETRI

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EDUCATION

Columbia University, Graduate School of Arts and Sciences

August 2011 - present

PhD. Physics

expected June 2017

M.Phil. Physics

June 2014

M.A. Physics

June 2013

Relevant coursework:

Advanced Programming Statistical Mechanics Quantum Mechanics

Physical Cosmology Classical Fields and Waves Quantum Field Theory

Scuola Normale Superiore, Classe di Scienze, Pisa, Italy

September 2006 - July 2011

M.S. Physics

July 2011

B.A. Physics

June 2009

EXPERIENCE

Morgan Stanley - Institutional Equity Division

June 2015 - August 2015, June 2016 - August 2016

Electronic Market Making (EMM) desk

New York

- Analyzed impact of systematic risk exposure on EMM portfolios traded in US equity markets during 2015
- Developed back test and real time analysis software tools to monitor EMM portfolio risk exposure
- Analyzed stock market historical data, with particular focus on US equity market trades from 2009 to 2014
- Developed mathematical models and algorithms for intra-day volume forecasts

Software developer

Fall 2013 - Present

Columbia University, NY

- Developed the LensTools Python library, that will prove useful in Weak Gravitational Lensing data analyses, with particular focus on ray-tracing simulations, astrophysical image analysis, data reduction and statistical inferences of model parameters from observations (project URL <http://lenstools.rtf.d.io>)
- Implemented from scratch the client and server side components of a three tier simple database service, using the C language socket API (code repository available on request)

Supercomputing

Spring 2014 - Present

Columbia University, NY

- Actively participated in a supercomputing research project on Cosmology from Non-Linear Weak Lensing at the Extreme Science and Engineering Discovery Environment (XSEDE), with more than 1.5 million CPU hours awarded
- Planned, directed and executed the production of a 30TB simulated dataset featuring lensed galaxy catalogs and Dark Matter density maps

Research

Summer 2012 - Present

Astrophysics – Large Scale Structure of the Universe

Columbia University, NY

- Served as peer reviewer for the American Astronomical Society (AAS) and for the journal Monthly Notices of the Royal Astronomical Society (MNRAS)
- Conducted statistical analysis of Cosmological Large Scale Structure simulated images, with particular emphasis on the development and implementation of new techniques to constrain physical model parameters
- Worked on Cosmic Microwave Background (CMB) data analysis, with particular focus on temperature image reconstruction starting from raw time ordered data (bolometric and pointing)
- Contributed to the development of CMB map-making software, implemented the corrections for pointing and calibration offsets

Teaching

Graduate student instructor

Fall 2012 - Present

Columbia University, NY

- Designed and taught as co-instructor a Modern Cosmology class aimed at high school students in the Columbia Science Honors Program (SHP)
- Taught several Physics Laboratory introductory courses aimed at pre-medical and engineering track students

AWARDS

- Co-recipient of the Allan M. Sachs Teaching Award for contributions to the educational programs in the Columbia University Physics Department (May 2016)
- Bronze medalist, 37th International Physics Olympiad, Singapore (July 2006)

SKILLS

Mathematical tools

Linear algebra, bayesian statistics, image processing

Programming Languages

Python, C/C++, Fortran90, Bash, R

Protocols & APIs

Object Oriented Programming, Parallel Computing (MPI), TCP/IP sockets, HTTP

Databases

MySQL

Tools

Distributed source control (git, mercurial)

Languages

Italian (native), French (intermediate)